

REMOTE MAPPING OF ALLUVIAL FAN SURFACES IN WESTERN CHINA

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Geomorphic surfaces are the libraries of past climate change in arid continental regions. Landforms and the stage of evolution of surfaces preserve evidence of past climates as far back as the early Quaternary. Land forms such as alluvial fans are well distributed in space and time so that maps of their locations and ages help define paleoclimatic patterns and gradients within arid continental interiors.

Remote sensing and digital topographic techniques have been used for some time to map major aggradational units on alluvial fans in the southwestern U.S. Visible-near infrared and thermal infrared sensors map compositional characteristics related to rock coating development, soil formation, and the concentration of resistant lithologies. Radars map roughness variations related to physical weathering,olian deposition, and fluvial dissection. Digital topography has been used to determine details of the uplift and dissection of individual fan units

The two flights of the Spaceborne Radar Laboratory (SIR-C/X-SAR) have allowed new radar image data to be collected in the continental interior of western China, where little information on paleoclimates exists. Combined with French SPOT high-resolution panchromatic images and high-resolution digital topographic data derived from ERS-1 and SIR-C interferometry, the SIR-C/X-SAR images allow recognition of alluvial fan units similar to those in the southwest U.S. An area along the Altyn Tagh fault has been mapped in some detail using these data. Field observations show that the units are distinguished on the basis of the same processes operating in the western U.S.

* work performed under contract to NASA